

NNA14ZSS001L Questions and Answers through 22 November 2013

1. Regarding the sample size.... “Intake powdered sample (0.1-2 grams) of rock cuttings or soil samples through a port”
 - How many samples are expected over the lifetime of the system?
 - **20 to 30**
 - Are separate sample containers required?
 - **No**
 - Is an expected particle distribution available? Is each sample intended to be tested as a whole or will each sample be subdivided for multiple tests either with the same fluids or multiple fluids?
 - **The particle size will depend on the sample acquisition method chosen. Each sample will be tested as a whole and will not be subdivided.**
 - What filtration level is expected when separating the mineral particles?
 - **150 microns**
2. Regarding the addition of fluid at 5 times the sample volume
 - Can this be based on sample mass or is volume preferable?
 - **Volume is preferred, but mass is acceptable**
 - What accuracy of this addition is required?
 - **Desired accuracy is +- 20%, required accuracy is +-50%**
 - Based on the range of sample sizes mentioned, will different sizes of containers be required or are all samples expected to be about the same?
 - **Sample size may vary but the same container is used for all samples**
 - Is it to be assumed that the water and salt are pre-mixed? Or is the solution made in-situ? What salt is used?
 - **The solution is premixed. Solution composition can't be disclosed here.**
3. What overall volume has been allocated for the SPD?
 - **The SPD and the analysis chamber must fit in a space identified in the 2020 rover PIP. The SPD must be no more than half the total volume.**
4. What is the total mass allocation of the SPD?
 - **This will be determined at a later stage. We estimate less than 3 kg.**
5. What is the power profile allocated to the SPD?
 - **The estimated peak power requirements are less than 50 watts for a few minutes per analysis.**

6. What quantities should be assumed for the prototype, engineering unit, qual, and flight units?
 - **These quantities are specified in the 2020 Rover AO and PIP.**
7. Should we assume that the payload controller (motion controller, etc.) will be included in another part of the payload or does it need to reside in the SPD?
 - **Control electronics may be located with the SPD or at another location.**
8. Can you provide draft milestones and schedule?
 - **These can be inferred from the schedule information provided in the 2020 AO and PIP.**
9. What are the sample sealing requirements?
 - **The sample must be placed in a chamber to which fluid is added. The requirement is that the fluid not leak out of the chamber.**
10. Does the storage of waste fluids and used particulate samples need to be stored in separate containers?
 - **No.**
11. Do the intake powdered samples (0.1-2 grams) of rock cuttings or soil require a filtering process to separate certain size particles?
 - **The maximum particle size that can be admitted is 1 mm.**
12. How many intake powdered sample samples should be stored?
 - **Samples are not stored after intake. They are analyzed. Waste from the analysis is stored.**
13. How many waste fluids and used particulate samples need to be stored (volume and number of separate containers)?
 - **At least one waste container is required. The maximum volume of waste equals the volume of processing fluid plus volume of sample analyzed.**
14. What is the total volume budget for the salt water fluid and reserve?
 - **This depends on the overall instrument volume. Refer to the 2020 AO for volumes designated for instruments.**
15. What are the volume, mass and power budgets for the Sample Preparation Device?
 - **See above for volume. Target mass budget is less than 4-3 kg. Target power budget is less than 50 W peak.**
16. Can pressurized gas be used in the system?
 - **Gas pressurization will not be used.**
17. What are the steps (concept of operations) per the science instrument team requirements?
 - **The science details will be clarified at a later stage.**

18. What are the detector system interface (mechanical (window)/electrical) requirements with the SPD?

➤ **The detector interface is a control cable and 2 fluid transfer tubes.**

19. During the sample preparation process, are any detectors planned or envisioned to check sample preparation integrity?

➤ **Temperature and pressure sensors are used in the process.**

20. Is there a cost budget range for the Sample Preparation Device?

➤ **Refer to the 2020 Rover AO for the instrumentation budget. The sample preparation device is expected to represent less than 50% of the overall cost of the proposed instrument. The partner organization will assist with estimating the actual cost.**